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RECENT LITERATURE.

THE SEVENTH VOLUME OF THE PALÆONTOLOGY OF NEW YORK.—Another of the splendid series of monographs of the Geological Survey of New York has recently appeared, and it certainly is not inferior in interest to any of its predecessors. It contains descriptions of the “Trilobites and other Crustacea of the Oriskany, Upper Helderberg, Hamilton, Portage, Chemung, and Catskill groups, and is notable especially for the elaboration of the species of Phyllocarida, some of which are described for the first time, and many fully illustrated.” This has been done by Professor John M. Clarke, to whom the preparation of the volume has been entrusted by Professor Hall. Palæontologists are familiar with the interesting discoveries made by Professor Clarke in this order. Among the more remarkable forms of which we are now afforded excellent byines, are the species of Echinocans, Tropicocans, Rhinocans, and especially the colossal *Mesothyra oceani*. Of Phyllopoda, some interesting forms are described and figured, as well as Cirripedia; while the remainder of the volume is devoted to the molluscs.—*P.*

GOODE'S AMERICAN FISHES.¹—This is the most comprehensive work which has yet appeared in which North American fishes are described in popular language, “with especial reference,” as the title-page informs us, “to habits and methods of capture.” The opportunities of its author have been unequalled, since as an officer of the U. S. Fish Commission, and as especially devoted to ichthyological science, he has been for years familiar with its work. Many of the important results of this work are set forth in the book under consideration. These embrace the determination of the nature of the migration, and time and place of breeding of many of the marine species. This subject is in the nature of the case difficult of exploration and elucidation, but a great deal has been accomplished by the Fish Commission in that direction, although much remains to be done. Among the discoveries brought to light by them may be cited the habits of that most valuable fish, the Spanish mackerel (*Scombromorus maculatus* Mitch.), which is in consequence likely to become more abundant in our markets than hitherto, through the protection which can be extended to it on its breeding grounds. The relative importance of the various food fishes is determined not only by their quality and abundance, but by their relation to

¹ American Fishes. A Popular Treatise upon the Game and Food Fishes of North America. By G. Brown Goode, Asst. Sec. Smithsonian Instn. New York: Standard Book Co., 1888, pp. 500.

other fishes, both as food and as enemies. In the former case we find the menhaden (*Brevortia menhaden*), which, says Mr. Goode, is "by far the most abundant species of fish on the eastern coast of the United States." Millions are captured every year, without any apparent diminution of their numbers resulting. As a raptorial fish, the blue-fish may be cited. The destruction it deals in every direction is thus described by Prof. Baird: "There is no parallel in point of destructiveness to the blue-fish among the marine species of our coast. The blue-fish has been well likened to an animated chopping-machine, the business of which is to cut to pieces and otherwise destroy as many fish as possible in a given length of time. . . . As already referred to, it must be borne in mind that it is not merely the small fry that are thus devoured, and which it is expected will fall a prey to other animals, but that the food of the blue-fish consists very largely of individuals which have already passed a large percentage of the chances against their attaining maturity, many of them, indeed, having arrived at the period of spawning. . . . An allowance of ten fish per day to each blue-fish is not excessive, according to the testimony elicited from the fishermen and substantiated by the stomachs of those examined; this gives ten thousand millions of fish destroyed per day. And as the period of the stay of the blue-fish on the New England coast is at least one hundred and twenty days, we have in round numbers twelve hundred million millions of fish devoured in the course of a season. Again, if each blue-fish, averaging five pounds, devours or destroys even half its own weight of other fish per day (and I am not sure that the estimate of some witnesses of twice this weight is not more nearly correct), we will have during the same period a daily loss of twenty-five hundred million pounds, equal to three hundred thousand millions for the season."

This book gives some means of judging of the utility of the U. S. Fish Commission. As a manual for fishermen it is the best yet published, and with the "Synopsis of Fishes of North America," by Jordan and Gilbert, furnishes an introduction to ichthyology such as few countries possess.

We notice some omissions from the accounts of fresh-water fishes, as, for instance, the omission of notice of the eel, and of commensurate reference to the important food-fishes of the family Catostomidæ. We might point out a few points needing correction, but they are very few, and refer to but one, on p. 15. Dr. Estes writes of the pike-perch (*Stizostedium vitreum* Raf.): "In these waters (Lake Pepin) the wall-eye is seldom found associated with any other fish than the sand-pike. It is true, however, that in swift-rolling waters, especially under falls, we find him in company with the black bass, but I believe that the force of the fall of the tumbling waters in a measure destroy the pugilistic nature of the bass, or he would not suffer

the wall-eye to remain in his company. In other locations the bass easily drives the wall-eye from his feeding grounds." This hardly does justice to the wall-eye. In the Tennessee river and its tributaries the wall-eye is *facile princeps* of the waters, not only from his size and speed, but from his courage. He holds his resting places clear of other fishes, and feeds on the black bass when he approaches too near. I have taken two black bass from the stomach of one wall-eye, of a pound and a half and a pound weight each. The wall-eye is the best food-fish of the Tennessee and its tributaries.

This work is illustrated throughout by excellent process-cuts, of which we present three on the accompanying plate.—*E. D. C.*

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Clark, W. B.—Ueber die geologischen Verhältnisse der Gegend Nord-
westlich vom Achen-see, etc. Inaugural Thesis for the Degree of
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